

**CAR RENTAL MANAGEMENT SYTEM WITH SMS  
ALERT**

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## **EXECUTIVE SUMMARY**

Technology is an absolute need we cannot escape from. It has an important role in most aspects of our lives. In other words, it is solution of every mankind problems. The importance of technology is aiming for comfort of use in whichever form it is. In this paper, it discuss about changing convenient method in managing car rental to standalone system. Before this, commonly car rental manages by record manually in a paper. These methods are not systematic and time consuming during searching and updating data. Other than that, when record data in file will risk of losing information as burnt in fire, ink split and so on. By proposed Car Rental Management System with SMS Alert will promotes better management in future. In this system, user can log on into the system and key in detail and wait for the admin response with rent a car status. There are several functions such as record information, update car status, and deleting data. In addition, it consist of special function where customer will receive SMS reminder to return a car on time and customer should not worried if forget password because SMS alert function able to sent recovery password to user. As a result, this system will make sure overall management process done efficiently and reduce time and cost in future.

## **RINGKASAN EKSEKUTIF**

Teknologi merupakan keperluan yang sangat penting pada masa kini. Ia mempunyai peranan penting dalam kebanyakan aspek kehidupan kita. Dalam erti kata lain, ia adalah penyelesaian setiap masalah manusia. Kepentingan teknologi adalah untuk memudahkan manusia dalam melakukan pekerjaan harian. Dalam projek tahun akhir ini, ia membincangkan mengenai perubahan kaedah yang mudah dalam menguruskan kereta sewa bagi menggantikan pengurusan secara konvensional sebelum ini. Pada masa kini, pihak syarikat menguruskan segala urusan mereka dengan rekod secara manual iaitu merekod di dalam borang. Kaedah ini tidak sistematik dan memakan masa untuk mencari dan mengemaskini data. Selain daripada itu, data rekod di dalam fail mempunyai risiko kehilangan maklumat akibat daripada bencana alam sebagai contoh kebakaran, tertumpah dakwat dan sebagainya. Dengan cadangan Sistem Pengurusan Sewa Kereta dengan SMS Peringatan akan menggalakkan pengurusan yang lebih baik pada masa akan datang. Dalam sistem ini, pengguna boleh melayari ke dalam sistem dan menunggu jawapan admin dengan sewa status kereta. Terdapat beberapa fungsi seperti maklumat rekod, status kereta kemaskini dan memadam data. Di samping itu, ia terdiri daripada fungsi khas di mana pelanggan akan menerima peringatan SMS untuk kembali kereta pada masa dan pelanggan tidak harus bimbang jika terlupa kata laluan kerana fungsi amaran SMS dapat kata laluan pemulihan dihantar kepada pengguna. Hasilnya, sistem ini akan memastikan proses pengurusan keseluruhan dilakukan dengan cekap dan menjimatkan masa dan kos pada masa akan datang.

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## **LIST OF ABBREVIATIONS**

- i. Radio Frequency Identification (RFID)
- ii. Global Positioning System (GPS)
- iii. Telemetry Transmitters (TT)
- iv. Return on Investment (ROI)
- v. Application Programming Interfaces (API)
- vi. Global System for Mobile (GSM)



## 1.0 INTRODUCTION

A car rental is a vehicle that can be used for a short periods of time by paying a fee. The individual are able to rent a car that suitable with them in affordable rate. Normally, the car rental business conducted in major cities and strategic places, airport or an island. With the car rental service, customers do not have to worry about moving from one destination to another without bringing own car. Car rental agencies provide car rental services to customers for the period required by the user. However, users must have a license before the vehicle is allowed to rent a car from the agency. With the car rental services enable users who do not have vehicles, have emergency cases, outstation rent a car to easier moving to target destination without worry to find public transport. However, some car rental agencies are still using manual system for managing rental car operations. No doubt they use the internet to advertise their space agencies but there were no specific systems to storing customer data or business process in the system.

CarRental2U is a car rental agency located in Seri Kembangan, Selangor. The agency is owned by a husband and wife and handled by them. Management of rental car is manually operated. The agency is open from 10am to 10pm. they do not have a rental car management system online. However, to make them known to the agency, Facebook is one medium to promote their agency.

Develop a system that will is a standalone system which has two interfaces, namely staff and admin, and customers. Some of the functions that are present in the system are the database of customers, staff, train, and car status. In addition, there are special features added to the system of sending SMS to the customer if you forgot your password and SMS reminders borrowing the car rentals.

En Sahlan Bin Muhammad Majid an agency owner and his wife are staff at the agency. Every morning, before the launch of the operating agency, his wife, Puan Halizah Bint Kamal will check all the car rented record. This is because to make sure customer will return a car on time. Pn. Halizah will also check the status of their agency's rental car that is free from police summonses after one week from the date of return of the rental car to ensure that each suit must be paid by the tenant in accordance with the agreement of both parties to the contract that was signed.

As usual, most of the customers have to contact the agency by phone in advance to check whether the date for the rent it's available or not available. After receiving confirmation that the vehicle is available on the required date, the customer will come to the agency for the rental of vehicles. CarRental2U always had been the choice for customers to rent a vehicle even if the company is just a small sized stores and management manually. The purpose of its customers rent vehicles in the agency is to use the size of MPV vehicles to wedding event, their car broke down and was in the workshop, a holiday with the family and so on.

To rent a vehicle, customers are required to fill out the form provided in advance. All car rental records are compiled in a file. For regular customers, they also need to fill out the form as to save time to rediscover the form that was previously in the file. Then, Pn. Halijah will record the detail date of the loan and the date the vehicle returnk in the record books. Receipt will be given to customers after making the payment during the process of renting a vehicle. Money deposit will be returned after the customer returns the vehicle.

## **1.1 Problem Formulation**

### **1.1.1 Problem Statement**

In this paper, I will propose a Car Rental Management System with SMS Alert to changing from manual system to standalone system. This is because the manual system is not systematic and time consuming during process of searching and any update done quite long time. Furthermore, by using manual system may risk losing of information such as by natural disaster, burning and losing of files. The system proposed will consist of adding, deleting, updating information in the system. The system is providing with security protection where only authorized people can log in into a system. Car Rental Management System with SMS Alert (CRMSS) consist of special feature GSM technology connect with the system. GSM Technology is a device that similar function with hand phone by insert sim card to running a function. It can send a SMS or MMS to hand phone. By using this technology in this system for sending reminder message to make sure customer returned a car on times. In addition, hand phone one of the important thing they bring everywhere. So of course by using SMS alert will be the best option to make sure return a car on times. Agencies may loss customer if

the previous customers do not return a car by on time. Other function of SMS alert is user can regain password in a short period of time if they forgot a password by sending direct to hand phone.

- 1) Manual system takes a long time to make a review of the list of records of customers who want to rent a vehicle in the future.
- 2) Staff must record the details of vehicles that have been hired each time renting a car.
- 3) Possibility to record the customer's name over and over again or missed the name of customers who want to rent a car will result in a loss to the agency.

### **1.1.2 Objectives**

The objectives of this research are:

- 1) To develop a standalone system can record all the staffs and members information. Two types of interface: interface for staff and admin, and interface for customers.
- 2) To enhance current system become staff do not have to key in the customers basic information again because all the information is already stored in database.
- 3) To give protection for all the data is safely because only authorised people can access into this system.

Target users:

- 1) Staffs in car rental agency
- 2) Admin
- 3) Customers who rent a car from this company

## **1.2 Review of previous works / researches and relationship to current project**

In this chapter, discusses about literature review of the project. It comprises of description about existing system and the problem faced by the users. Literature review will study and relates the journal or article about the business management and how far impact of technology in company profit. Several existing system also will discuss briefly in this chapter about the characteristic, advantages, and disadvantages the system. Different types of framework, technology and method use by different car rental agency in order to compete between each other. In this chapter, by study and analyze all the data is important to develop and proposed better system to replace existing manual car rental management system. Mostly the agency that using latest technology to manages their business is large company and already well known at that area. So, the company afford to invest in improvement of management by promote latest technology in the business management.

The rapid growth of interactive Internet services has led to constantly increasing Web sites (Berners-Lee, T., et. al, 1992). We have also experienced an increase in their functionality, which, in turn, makes them more complicated to use (Nielsen, J., 2000). Thus, a useful web application should be based on traditional graphical user interface designs which rely on menu selection and navigation. But these interfaces require a considerable cognitive overhead. This may be tolerable to frequent users, but will in many cases deter casual users, especially those who are not yet used to computers. (Nielsen, J., 1993)

Management Information System is a system or process that provides information needed to manage organizations efficiently and effectively. Management information systems involve three primary resources: technology, information, and people. It's important to recognize that while all three resources are key components when studying management information systems, the most important resource is people. Management information systems are regarded as a subset of the overall internal controls procedures in a business, which cover the application of people, documents, technologies, and procedures used by management accountants to solve business problems such as costing a product, service or a business-wide strategy. Management information systems are distinct from regular information systems in that they are used to analyze other information systems applied in operational activities in the organization. Academically, the term is commonly used to refer to the group of information management methods tied to the automation or support of human

decision making, e.g. decision support systems, expert systems, and executive information systems (Wikipedia, Online).

Meanwhile a web service is a collection of protocols and standards used for exchanging data between applications or systems. Software applications written in various programming languages and running on various platforms can use web services to exchange data over computer networks like the Internet in a manner similar to inter-process communication on a single computer.

Furthermore, the meaning of software engineering is the computer science discipline concerned with developing large applications. Software engineering covers not only the technical aspects of building software systems but also management issues such as directing programming teams, scheduling and budgeting. Software engineering has several documentation that must done with the development of the system. There are Software Development Plan (SDP), Software Requirements Specification (SRS) and Software Design Development (SDD).

### 1.3 Explanations of the current system and its limitation

Before proceed with developing the new system for CarRental2U, deeply study about the current system is done. All the description about the process in car rental management is record to make sure knows about the overall flows of management very well. The manual system process before, when customer walk in to the agency, staff will fill the information about user first. This is because to make sure if anything happen such as accident or lost, can report to the police and claim for insurance. Other than that, customer should wait about 15 minutes for processing their request. Other method to rent a car by SMS to agency first for booking first before rent a car. By this way can reduce time waiting for processing but to make sure customer is serious to rent a car, transaction should be done by bank in deposit to the agency first. After that, staff from the company will sent a car direct to the customer and brings along the form to fill in by the customers. All the information will stored in a file by manually. By this method will cause time consuming because should wrote by pen all the customer information by manually. For the return customer also, staff will fill in again the information because if searching back the record from the file, it will take time and sometimes previous record is lost and cannot be found.

The screenshot displays the HTi RENT A CAR website. At the top, there are language options (English, Español, Português) and a navigation bar with links to HOME, VEHICLES, FAQ, and LOCATIONS. The main content area is divided into two sections: 'Our locations' and 'Contact'.

**Our locations**

| Location                                     | Address  | Phone          | Fax            | Toll-Free     | Hours   |
|--|--|----------------|----------------|---------------|---|
| HTI - CENTRAL RESERVATIONS                   | 150 SE 2ND AVENUE - SUITE 913<br>MIAMI FLORIDA, 33131<br>UNITED STATES [MAP] | (305) 379-5400 | (305) 675-2686 | 1800-566-4812 | Monday: 9:00 AM - 5:00 PM<br>Tuesday: 9:00 AM - 5:00 PM<br>Wednesday: 9:00 AM - 5:00 PM<br>Thursday: 9:00 AM - 5:00 PM<br>Friday: 9:00 AM - 5:00 PM<br>Saturday: 10:00 AM - 2:00 PM<br>Sunday: Closed           |
| Alamo Rent a Car - Albuquerque Airport (ABQ) | 3400 UNIVERSITY BLVD SE<br>LAS VEGAS NM, 87106<br>UNITED STATES [MAP]        |                |                |               | Monday: 6:00 AM - 1:00 AM<br>Tuesday: 6:00 AM - 1:00 AM<br>Wednesday: 6:00 AM - 1:00 AM<br>Thursday: 6:00 AM - 1:00 AM<br>Friday: 6:00 AM - 1:00 AM<br>Saturday: 6:00 AM - 1:00 AM<br>Sunday: 6:00 AM - 1:00 AM |
| Alamo Rent a Car - Anaheim Disney Downtown   | 1565 SO DISNEYLAND DR<br>ANAHEIM CA, 92802                                   |                |                |               | Monday: 8:00 AM - 5:00 PM<br>Tuesday: 8:00 AM - 5:00 PM<br>Wednesday: 8:00 AM - 5:00 PM<br>Thursday: 8:00 AM - 5:00 PM  |

**Contact**

First name:  Last name:

E-mail:  Phone:

Country:

Message:

Send to:

HTIRentACar is a company that provides car rental services online. The interface is a simple website can provide comfort to the user to use it. The function that provided on the website is to make a reservation, and price list of vehicles for rent, car service branch address. To make a reservation, customers should put the date of borrowing and returning, location to pick up a rental vehicle and then select the desired vehicle. After that, the customer must fill out the personal details and the booking process was successful without having to pay the cost of the car first.

The screenshot displays the Enterprise car rental website's reservation interface. At the top, the Enterprise logo is on the left, and navigation links for 'Language: English', 'About Us', 'Contact Us', and 'Help' are on the right. Below this is a horizontal menu with options: 'Rent a Car', 'Business Rentals', 'Rent a Truck', 'Buy a Car', 'Manage Your Fleet', and 'Careers'. The main content area is divided into three columns. The left column contains links for 'Buy a Car', 'Used Car Deals', 'Join Our Business Rental Program', 'Long Term Rentals', and 'email extras'. The middle column, titled 'Make a car rental reservation', contains a 'Rent a car in:' dropdown set to 'US', a 'Pick Up Location' field, 'Pick Up Date & Time' and 'Return Date & Time' dropdowns, a 'Vehicle Class' dropdown, a 'Renter's Age' dropdown, and a 'Search' button. The right column features a 'Login to Enterprise Plus' section, a promotional banner for 'Weekend Special \$9.99 per day', and an 'Introducing Enterprise CarShare' section. The bottom of the page has a green footer.

Enterprise car rental is a large car rental agency and offers a wide range of other services in the same company. For example, customer may rent a car for a few days and also for a long time in an affordable price. The company promote a various attractive deals on offer special for their customers. The website packed with info and also briefly explanations makes the user easy to use the website. The service provided on the website are: Rent a Car , Used Cars for Sale , Manage Your Fleet, Careers, About Us ,Contact Us, Reservation , Vehicles , Locations , Business Rentals , Print Your Receipt , Help, Travel Agent ,Site Map ,Customers with Disabilities , and Global Franchise Opportunities .

For users who want to change the date of booking the car after signing up, they can do so without incurring any additional charges. When customers have been convinced by the change, they may print the receipt detail rent it.

CarRentals.com is a car rental agencies located in the United States guarantees the lowest car rental prices in addition to the promotion of interest. The users are also now able to browse the website of the car rental using a smart phone for user's android phone and iPhone app. Order of the functions contained in the website is organized and the use of the color orange as a theme is a perfect choice for showing the website attractive and convincing customers.

HAWKRentACar is a car rental company that is known and has many branches, both in and outside the country. Between the countries involved are Malaysia, Singapore and Hong Kong. The company is certainly well known and various services offered by the



company as an hourly car rental, monthly car rental, and service or rent a car and personal driver. Types of vehicles offer also consists of a variety of brands to provide satisfaction to our customers. On the website, customers do not need to go to another page for all information included on the main page. Function list offered on the website are:

- 1) Home
- 2) Fleet guide
- 3) Services
- 4) Corporate information
- 5) Regional offices
- 6) Worldwide booking

For this chapter, we will cover all the relevant advantages, disadvantages and limitations contained in the four car rental website. This is important because as a reference to create a new system more organized and meet the needs of customers and staff in the management of a rental car in future.

| Company               | Advantages  | Disadvantages   | Limitations   |
|-----------------------|---|---|---|
| HTIRentACar           | -A simple home page and complete the user easily make use of the website.   | -Vehicle rental rates are not mentioned on the website when the customer reviews of vehicles offered  | -Lack of service options offered on the website makes customers wonder of new vehicles offered by the company and the type of promotion that will be offered. |
|                       | -Users can continue to make reservations by date are in want before selecting the vehicle they want.  | -Use colours that are ambiguous and less interesting that makes website looks bland and unexciting.   | -No information related to the company makes a bit less confident customers some background related companies.  |
| Enterprise Car Rental | -Orderly arrangement of content and security features for which there are two interfaces, namely to members and non-members.                  | -The various services offered by the company other than car rental customers result in a bit confused to select the function button provided. | -No list of vehicles and rental prices shown in the website.  |
|                       | -When booking, we can choose the type of vehicles demanded reservations in advance to ensure that the vehicle is available as a desired date. | -No explanation on the advantages gained to make car rental booking as member and non-member  |   |

|                |  |   |  |
|----------------|--|---|--|
|                | -Arrangement of various functions in an organized and neat in a homepage display makes the user easy to use.                                     |   |  |
|                | -Choice of language is also an advantage for the website because it is a bonus for some countries are still not familiar with foreign languages. |   |  |
| CarRentals.com | - An attractive website, the use of bright colors allows it to appear cheerful and interest to the customer to explore the entire website.       | -To know in detail related to car rental agencies, they must become a member first. | -No rental car rates specified in the site |
|                | -Each function will be included also some explanation to facilitate customers to use each function contained in the website.                     |   |  |
|                | -Button function is also simple and straight to the next page without having to scroll down to find the desired page.                            |   |  |

|                 |   |   |   |
|-----------------|---|---|---|
|                 | -Users do not need to make reservations in advance, but they can find a suitable date with the rental vehicle may be required in advance of the date desired. |   |   |
| Hawk Car Rental | -Rental vehicle prices stated on the website.   | -Features on the main page a bit stringy and irregular because there is ad space rented to outside parties. | -Confusing when making transactions money the company have to many branches around the world. |
|                 | -All promotions mentioned in the main page.   |   |   |

#### **1.4 Explanations of terminology**

Web based- it is an application that is usable and addressed over a computer network such as the internet or an intranet and uses HTTP as its primary communication protocol.

Platform- it is the combination of hardware architecture and a software framework that allow both to run together.

#### **1.5 Method approach in previous system**

Hypertext Preprocessor (PHP) is used to design the web based car rental management system. PHP is chosen as a language because allows web page builds, and flexible for complex programming tasks.

##### **1.6 Indications of scope and limitations of study**

Nowadays, using manual systems management performance rental car is less relevant because it will reduce productivity in management. Besides, by doing it manually managing rental car will take a long time and storing documents in the file are at risk of missing information. Users who will use the system consist of admin, staff and clients. The user requirement and existing manual procedures of management process will be collected through interview and observation for applying into the future system.

##### **1.6.1 Project scope**

Modules:

- 1) This application consist two types of framework: staff and admin, and customer only.
- 2) The application is design in simple user interface and easy to use by all background of user.
- 3) The application allow user to fill in a form before staff will approve or reject due to availability of car rental.
- 4) The application is developed by using Microsoft Visual Studio 2008

## **Chapter 2 Report Body**

This section describes the general function and requirement of the project. It also includes the product constraint and assumption. The specific requirement will be defined in details in part 3 of the technical report.

The following subsections consist in this section are:

- 4) product perspective
- 5) product functions
- 6) user characteristics
- 7) constraints
- 8) assumptions and dependencies
- 9) apportioning of requirements

### **2.1 System requirement:**

#### **GSM**

GSM is a 2<sup>nd</sup> generation cellular mobile system to cater voice services and data delivery using digital modulation. The chosen device in this project is Q24 GSM MODEM to provide sending SMS in our project.

#### **Microsoft Visual Studio 2008**

Microsoft Visual Basic 2008 as the language used in the develop system because it is simple and easy when compared to the other language. If we are having trouble coding used, can easily find the solution on the internet with detailed descriptions of the main reasons the function that is built does not work.

#### **Microsoft office 2007**

Microsoft Access 2007 is a relational database management system that's combines the relational Microsoft Jet Database Engine with a graphical user interface and software-development tools. Microsoft Access as database use is because it suits with VB2008 and has the ability to link data in its existing location and use it for viewing, querying, editing and reporting.

### **2.1.1 Comparison between the previous system and system approaches**

To ensure that the resulting system is a competitive system and has a market value of its own, some web-based system was used as the reference. This is important to ensure CRMSS can meet staff and customer satisfaction CarRental2u. Studied various aspects of the existing system in terms of advantages, disadvantages and limitations is importance in order to making better system. Existing system of reference is important because for sure meet the staff and customers. For example, the logical functions that should be present in the system are existed. In addition, the arrangement and color also play a role in the production of a good system. After studying the functions available in four web-based systems, we are able to make the evaluation and improvement of the resulting system. In essence, the resulting system is a web-based system, but for reasons only suitable GSM modem code in VB2008 and to avoid the resulting system experiencing problems, we use a standalone system. There is the advantage of this system is the GSM modem is used to enable the user knows their password if forgotten and staff can send reminders to customers to remind them to return the vehicle on time.

### **2.2 Technic/ theory/ flow chart/ all relevant diagrams**

In this report, my systems have been classified into four types of flow chart. One overall system flowchart, three functions flow chart, and one use case diagram which represent the types of forms that can be accessed by each categories of users.

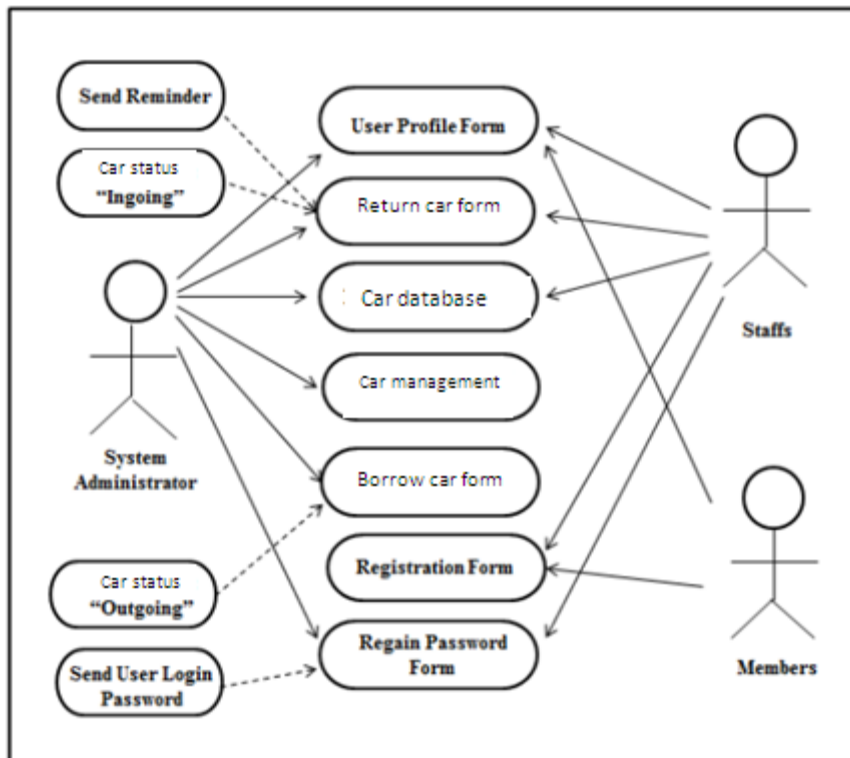


Figure 2.2.1 shows: Car Rental Management System Use Case Diagram

Use case diagram above shows the type of form that different category of users able to log on in car rental management system.

